



Building Supplemental Instructions

Table of Contents

- Section 1: Inspection and Construction Management
- Section 2: Landscape Irrigation Systems
- Section 3: Roofing
- Section 4: Painting
- Section 5: Door Hardware Coordination
- Section 6: Common HVAC, Plumbing and Electrical Installation Requirements
- Section 7: HVAC
- Section 8: HVAC Building Automation System
- Section 9: Plumbing
- Section 10: Electrical
- Section 11: Labeling and Identification
- Section 12: As Built Drawings
- Section 13: Preferred Products
- Section 14: Spare Parts

General Notes:

1. Any and all quantities noted on the construction drawings shall be used for general reference purposes only. The contractor is responsible to determine all final quantities.
2. Without specific written consent given prior to bid by the City of Scottsdale (COS) product catalog numbers and/or descriptions listed in Section 13: Preferred Products shall take precedence over those listed in other specification sections and/or those reviewed/approved by the architect/engineer.
3. Questions and/or conflicts concerning this specification section shall be sent in writing to the City of Scottsdale and/or Architect for resolution prior to bid. Otherwise, this section shall take precedence over construction drawings and specification sections.

Section 1: Inspection and Construction Management

A. General Requirements

1. Submit written electrical "Lock Out Tag Out" (LOTO) procedures to the COS Construction Administration Supervisor prior to the beginning of construction.
2. Third Party Testing and/or Inspection Advance Notice: The COS Inspector shall be given a minimum one business day advance notice for testing/inspections.
3. General Contractor PDF daily reports shall be submitted via email to the COS Inspector and others as directed by COS by the end of each business day.

B. Certificate of Occupancy Required Inspections

1. As applicable, the following are required inspections/forms by other city departments to be scheduled/submitted by the contractor prior to the city being able to issue a certificate of occupancy:
 - a. Lowest Floor Elevation. Submit as the form requires. Form can be provided by COS Building Inspector. Submit after the building pad is poured. Retain a copy to be included in the close out documents.
 - b. All Fire Marshal Inspections via the COS online scheduling system
 - c. Water Backflow Third Party Inspections. Email the third party inspection results to the COS Water Dept. at backflowtesting@scottsdaleaz.gov. **INCLUDE THE PERMIT NUMBER IN THE SUBJECT LINE.** The Water Dept. will then send you a confirmation email. Schedule a final inspection via the link on the confirmation email. A COS Water Dept. inspector will then do a final inspection. Any deficiencies will require a follow-up inspection and must be corrected before they approve the installation.
 - Example of how the email subject line should read:
Backflow Inspection Request: Fire Station 612, Permit # 258364
 - Existing Buildings. The Water Dept. requires that existing fire and water line backflow certifications are up-to-date prior to issuing a Certificate of Occupancy. Email the COS Facilities Department at FMCONTRACTS@SCOTTSDALEAZ.GOV to verify that certifications are up to date. Request that Facilities Dept. re-certify if they are out of date.

C. Other Testing/Inspections

1. Underground drainage lines shall be water tested by providing a 10' section of 2" minimum test pipe at the highest point of the drainage system filled with water for 30 minutes with no drop in water level.
2. All potable water lines shall be hydrostatically tested at 120 PSI for four (4) hours with no drop in pressure.
3. Coordinate a final SWPPP site walk through with the COS Project Manager prior to submitting the Notice of Termination.

Section 2: Landscaping and Irrigation Systems

A. General Requirements

1. Refer to City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Works Construction for additional installation requirements and details.

Section 3: Roofing

A. General Requirements

1. Crickets shall be installed on the uphill side of any equipment base, ductwork, etc. wider than 12".
2. The interior of parapet walls 48" and less in height (not viewable by the general public) shall have the roofing material run up the wall and over the top of the parapet wall under the cap. Parapet walls over 48" high shall have the roofing material run up the wall 18" minimum.
3. All four sides of roof drain pans shall be sloped to the drain.

Section 4: Painting

A. General Requirements

1. REMINDER: Priming/preparation as required in the specifications shall be strictly enforced.
2. All cover/switch/receptacle plates, door hardware, etc. shall be removed prior to priming/painting.
3. Three coat systems shall have a white primer coat, 1st paint coat shall be 20% darker than final color, 2nd paint coat shall be 10% darker than final color, and the 3rd paint coat shall be the final color.

Section 5: Door Hardware Coordination

A. Hardware

1. Contact and coordinate hardware purchase with the COS Locksmith at the beginning of construction.
2. Provide construction cores and keys during the construction period. Construction control, operating keys and cores shall not be part of the COS permanent keying system or furnished on the same keyway (or key section) as the permanent keying system.
3. Permanent cores shall be purchased by the contractor. The manufacturer shall email the COS locksmith at **FMLOCKSMITH@SCOTTSDALEAZ.GOV** to determine core and keyway. COS will install permanent cores and return the construction cores to the contractor.
4. Install factory made steel guards over door latches on park, trailhead, storage and other remotely located building doors.
5. Cores and uncut key blanks (one per core) shall be sent by the manufacturer via registered mail, return receipt requested to:

***Locksmith, City of Scottsdale Facilities Department
9191 San Salvador Drive Scottsdale, Arizona 85258***

Section 6: Common HVAC, Plumbing and Electrical Installation Requirements

A. General Requirements

1. There shall be no duct, conduit, piping, etc. that will interfere with a solar tube having an unobstructed, vertical path from the roof to the ceiling below.
2. There shall be a minimum of 4" clearance between any electrical, plumbing, HVAC, etc. component routed above removable ceiling tiles. There shall be sufficient space in the ceiling cavity to remove ceiling tiles (without damage) when components (such as fire alarm devices, speakers, etc.) are mounted on the ceiling tile.
3. Piping and conduits shall be sleeved through the roof structure with a sleeve sized to allow 1" of clearance around all piping/conduits/insulation, etc. and shall extend a minimum of 12" above the finished roof. Sleeve openings shall be made waterproof.
4. All roof equipment and/or concrete pad mounted ductwork, piping, conduits, shall be supported by a Unistrut style frame/base and rubber Durablock style sleepers.
5. Piping/conduit penetrations through below ground foundation walls shall be sleeved and shall provide 1" minimum, 360 degrees of clearance. Piping/conduit shall be centered in the sleeve. Seal sleeve ends.
6. Piping/conduit routed under building footers shall be sleeved. Sleeves for conduit up to 4" shall be 6". Sleeves for conduit over 4" shall be 6" minimum larger than the conduit(s). Piping/conduit shall be centered in the sleeve. Sleeves shall extend a minimum of 12" past the edge of the footer. Seal sleeve ends.
7. All HVAC control and building energy management wire, including thermostat wiring, shall be in conduit.
8. All sleeves under footers, sidewalks, etc. shall be sealed. Spare sleeves shall have a removable cap on each end and a #12 tracer wire installed the entire length of the sleeve.

Section 7: HVAC

A. General Requirements

1. See Plumbing and Electrical sections for other applicable requirements.
2. Triple duty valves shall not serve as isolation valves.
3. All HVAC equipment located above removable ceilings shall be installed no higher than 24" above the ceiling. Isolation valves, disconnect switches, etc. shall be located as close as practicable to the unit.
4. All HVAC equipment requiring regular maintenance located above permanent ceilings shall have a 22"x22" access door and a work platform with a switched light and receptacle.
5. Condensate lines shall be copper, insulated for the first 10' from an indoor unit and have unions installed within 12" of the condensate outlet at the unit and on each side of the p-trap.
6. Install check valves where a backflow preventer serves two or more areas. *Example: cooling towers, chilled water loop, etc.*
7. All Split Direct Exchange Systems shall have the refrigerant charge type and weight logged and labeled on the unit. A typewritten log of these weights shall be included in the close out documents.

8. For systems equal to or greater than 25 tons 1) provide 2" taps with valves on chilled water closed loop systems for system cleaning requirements and 2) provide taps and valves for chilled and condenser water lines for temporary emergency equipment connections. Locate per COS direction.
9. Install 26 gage minimum sheet metal sunshield on all exterior flexible duct connectors.
10. Type AX belts shall be installed on all belt driven equipment.
11. Spacers shall be installed (width as required) in between or on the outside edge of air filters to eliminate gaps that allow unfiltered air to reach the coils.
12. Controls for all exterior rollup and/or man doors larger than 35 sq. ft. shall be added (if not specified in the construction documents) and tied to the make up air/exhaust/air conditioning controls system required for truck bay doors in the same space.

Section 8: HVAC Building Automation System

A. System Description

1. The contractor shall install a complete Wide Area Network (WAN) Automation System (BAS). The Graphic User Interface (GUI) shall be displayable in HTML format, used as a common operating platform for all integrated control systems and shall be the Java-based Niagara N4 Framework. The entire HVAC control system shall be a network of inter-operable, stand-alone controllers communicating via BACnet communication protocols. COS shall sign a copy of the manufacturer's standard software and firmware licensing agreement as a condition of this contract. Such license shall grant COS use of all programs and application software as defined by the manufacturer's license agreement. COS shall receive ownership of all project software configuration documentation, data files, and application-level software. This shall include, but shall not be limited to, all software codes and documentation for configuration and programming that is generated for the project and/or configured for use within Network Area Controllers, Web server(s), and any related LAN/WAN/Intranet and Internet connected routers and devices. All required IDs and passwords required for access shall be provided. Upon installation of the BAS Graphic User Interface, the contractor shall provide (1) four-hour training session on the BAS and all system integration equipment. After system commissioning, or when COS determines that the BAS hardware and software has achieved an acceptable level of performance, the contractor shall provide (2) four-hour training sessions. Final Network Area Controller Global Control Functions and I/O Summary shall be reviewed and approved by COS.

Section 9: Plumbing

A. General Requirements

1. All potable water and compressed air lines shall be copper. All underground copper piping shall be encased in a plastic sleeve.
2. All potable water line piping from the meter to the building and under building pads shall be soft drawn Type K. Water lines under building pads shall have no joints. Joints may be placed if the distance between the meter and the building is over 100'. All soft copper joints shall be brazed. Keep joints to the minimum possible. Electronic ballmakers (per COS detail 2397) shall be placed at joints.
3. All copper piping penetrating concrete floors, pads, etc. shall be sleeved. Sleeves shall extend 4" minimum above the surface of the concrete and shall be one trade size minimum larger than the water pipe it protects. Completely fill the sleeve with a waterproof sealant.
4. All equipment including pumps, water hammers, hose bibs, water heaters, expansion tanks, etc. shall have isolation valves on incoming and outgoing lines. Install valves behind an access door 24" above wall mounted hose bibs. Roof top hose bibs shall have the valve accessible on the roof.
5. All equipment piping shall have a brass union between the equipment and its isolation valve.
6. Water closet offsets shall not be used.
7. Air admittance valves may only be used with prior written approval from COS.
8. End of the line clean outs shall be provided for the main drainage line and all main branch lines 2" and larger.
9. Cleanouts shall be provided for all urinals and sinks.
10. All cleanouts shall be located in walls. Urinal cleanouts shall be located directly above, or adjacent to, the flush valve. Water closet cleanouts shall be placed at 24" AFF. All other cleanouts shall be placed at a height

so that the cover plate does not overlap the cove base or sheetrock/wall tile. Multiple cleanouts in the same room shall be placed at a uniform height.

11. Clean outs in plumbing chases shall point towards the chase entry.
12. All clean out plugs shall be the raised square style and shall be set to be flush with the stud face. The access opening in the finished wall shall be a minimum of 2" larger in diameter than the clean out plug.
13. All drainage/vent lines shall be DWV rated schedule 40 PVC.
14. All building drainage lines shall have a 2% slope.
15. All drainage main lines under building pads shall have cleanouts a maximum of 75' apart.
16. All below ground, non-glued drainage line sections shall be connected with 4 band shielded connectors.
17. All exposed interior/exterior drainage/vent line sections installed less than 8' AFF and/or subject to damage shall be cast iron.
18. All drainage, vent and water lines shall have a bedding of sand or finely screened (rock free) native material 4" below and 12" above the pipe.
19. Pipe requiring insulation shall be installed so that the insulation will be set back $\frac{1}{2}$ " minimum from the stud face. Insulation shall not be removed or reduced to meet this requirement.
20. Pipe insulation shall be continuous and full sized when passing over hangers, through walls/structural elements, etc.
21. All buildings shall have a double cleanout with a 12"W x 12"D concrete apron.
22. All exterior valve boxes, clean outs, etc. shall have a 12"W x 12"D concrete apron.
23. Test ball access points shall be installed parallel with the wall so they are not confused with clean outs.
24. When waterless urinals are specified, stub out a 3" long capped water line feed with escutcheon plate at the future valve location for a future water line connection. The water line header feeding the urinal(s) shall be controlled by a dedicated valve. The stub out shall be painted to match the wall.
25. All buildings shall have a pressure reducing valve (PRV) at the main water line building entry point (inside the building) or on the downstream vertical leg (above ground) of the backflow preventer.
26. Hose bibs shall be provided within 15' of all roof top and ground mounted HVAC equipment requiring water for maintenance procedures.
27. Water zone and HWR balancing valves shall be inside wall access panels at 60" AFF. Piping shall be arranged and enclosures shall be sized to allow maintenance and replacement and that all valves are able to be set in the "off" position at the same time.
28. Tank style water heaters shall not be installed higher than 36" AFF.
29. Water, drainage, and vent lines closer than 1.5" from plywood backer board shall be protected with 16 gage sheet metal.
30. All restroom floor drains shall be fed from the vacuum tube of a water closet/urinal flush valve. Exposed supply tubing shall be chrome plated or flexible braided stainless steel. The tap shall be placed so a minimum amount of exposed tubing between the flush valve and the wall will be installed. Install a 1" diameter, or less, chrome escutcheon plate where the tubing penetrates the wall. One tap shall feed only one floor drain unless approved by COS. All other floor drains (except truck bay trench drains which shall have trap guards) shall be fed from an electronic trap primer installed at 60" A.F.F. behind a 24" x 24" stainless steel access door with screwdriver latch access. Copper tubing between floor drains and the electronic trap primer(s) shall be 25' maximum. Install the water supply valve inside the enclosure. Surface mount trap primer, receptacle, and water valve on CMU walls. Coordinate with the electrician who shall install a GFCI receptacle adjacent to the trap primer.
31. All water piping (hot and cold) exposed in public areas shall be insulated and covered with an aluminum jacket.
32. Copper piping shall not be routed inside CMU walls
33. Section 12.G required plumbing video(s) shall be submitted to COS for final review and approval prior to pouring the building pad.

Section 10: Electrical

A. General Requirements

1. Existing Building Electrical Panel or Building Shutdown Procedure. Email the following to the project COS Building Inspector and the COS Construction Administration Supervisor a minimum of five business days prior to the shutdown:
 - The electrician's Lock Out Tag Out (LOTO) procedures (if not submitted already).
 - An MOP, including but not limited to, which panel(s) will be de-energized, bullet point timeline describing work to be completed, starting/end time, etc.
2. Performing work on energized equipment or circuits is strictly prohibited.
3. All wire shall be copper; #12 and larger wire shall be stranded.
4. All disconnect switches for HVAC equipment shall be fused and heavy duty rated.
5. All conduits with circuits rated 120V or greater entering j-boxes, disconnect switches, etc. through concentric or non-concentric knockouts shall have ground bushings.
6. Conduits under building pads shall have a minimum 6" of backfill above them.
7. Conduit shall be $\frac{3}{4}$ " minimum.
8. Lighting and receptacle branch circuits with a maximum 120V or 277V OCPD rating of 20A shall be in conduit from the branch panel to the first accessible j-box. Stranded wire Metal-Clad Cable (MC) may be used thereafter in accessible, concealed ceiling spaces only. All MC shall have a full-sized equipment ground wire and 600V rated insulation. Anti-short bushings shall be used at all terminations. MC shall be installed parallel and perpendicular to structural elements and shall not have more than four bends (90 degree maximum per bend) between junction boxes. MC runs shall be grouped together in a neat, workmanlike manner. All circuits serving motors shall be in conduit. Transition MC to EMT prior to routing inside wall cavities.
9. Recessed branch panels shall have (4) $\frac{3}{4}$ " spare conduits stubbed up into an accessible ceiling space.
10. All new in-ground pull boxes, in asphalt or landscaped areas (subject to public/maintenance vehicle traffic), shall be traffic rated and shall have a 12"D x 12"W concrete apron. All wiring connections and splices shall be waterproof. Conduits shall enter from the bottom and shall extend 6" minimum into the pull box. Conduit entries shall be sealed watertight.
11. All light switch, receptacle and blank cover plates shall be stainless steel.
12. All storage room and closet lighting shall be controlled by wall switch style motion sensors. Set timer to turn light off after 5 minutes of no motion.
13. Receptacles shall be placed 6" (center to center) from adjacent data outlets.
14. PVC shall not be used for exposed interior/exterior conditions.
15. Receptacles requiring GFCI protection shall be GFCI rated. GFCI protection shall not be provided by an upstream GFCI receptacle or circuit breaker. GFCI breakers to be installed if the GFCI receptacle will not be readily accessible by the piece of equipment it serves.
16. Grounding electrode conductor connections to ground rods, water pipes, building frames, UFER grounds, etc. shall consist of individual runs back to the service entrance ground bus. They shall not be daisy chained.
17. Install a GFCI receptacle inside the electronic trap primer enclosure. See Plumbing section for coordination requirements.
18. All restrooms, utility rooms (electrical, mechanical, etc.), kitchens and accessible plumbing chases shall be provided with emergency lighting or (if provided) shall be connected to the emergency generator.
19. Provide a dedicated circuit and 120V receptacle for the Building Automation Control JACE Control Panel. Coordinate location with the system installer.

B. Light Poles

1. All light poles shall have a concrete pull box with tamperproof bolts securing the lid located within 48" of the base. Underground branch circuit serving light poles shall be XHHW.
2. Install inline fuses in the light pole hand hole. The cover plate shall be secured with tamperproof screws.
3. All circuits entering pull boxes shall have 24" of spare conductor neatly coiled in the box prior to exiting to the next pull box. Secure coils of wire with plastic zip ties.
4. Each light pole type shall have a Light Pole Foundation Base detail stamped by an Arizona Structural Engineer

C. Fire Department Dispatch System (Fire Stations Only)

1. Fire Alarm System Antenna Requirements

- Radio Antenna Location. Coordinate with Phoenix Fire for exact location of the two antennas located on the parapet wall on the roof.
- Unistrut for Antenna Support Conduits. Install two 10' sections of 2" unistrut horizontally on the parapet wall (one upper, one lower) vertically spaced 24" apart.
- Antenna Support Conduits. Attach two sections of 1.25" RGC for antenna supports horizontally spaced 72" apart on the unistrut. The bottom of the conduits shall extend a minimum of 6" past the lower unistrut support, the top shall extend 24" above the parapet cap.
- IT Room Ground Bus. Install one 12" x 2" ground bus bar in the IT room. Route a #6 ground wire from the ground buss bar and attach to building steel or route as a dedicated grounding electrode conductor terminated at the service entrance ground bus.
- Conduits for Antenna Cabling. Install one 1.25" EMT conduit for each antenna from 8' AFF in the IT room to the roof and locate 24" from the parapet wall at each antenna support conduit location. Stub up 18" above the roof and install a gooseneck on each conduit. Use wide sweeps instead of 90 degree bends for the conduits.
- Conduit for System Grounding. Install one 1" EMT conduit for system grounding requirements from 8' AFF in the IT room to the roof and locate next to one of the 1.25" EMT Antenna Cabling conduits. Stub up 18" above the roof and install a gooseneck. Use wide sweeps instead of 90 degree bends for the conduit.
- Antenna Support Conduit Grounding. Install ground clamps to the bottom of each antenna support conduit. Daisy chain a #6 ground wire between both and then route the ground wire through the 1" EMT System Grounding Conduit to the IT room. Terminate on the ground bus.

D. Fire Alarm System Conduit

The entire fire alarm wiring system shall be installed in 3/4" (factory colored red) conduit only.

E. Fire Alarm System Coordination

1. New Fire Alarm System Radio Dialer. The fire alarm system installer shall email the COS Facilities Department at **FMCONTRACTS@SCOTTSDALEAZ.GOV** to coordinate receipt of an authorization letter to purchase and install the dialer. The dialer cannot be purchased without the authorization letter.
2. New Fire Alarm System Account Set Up.

The radio dialer **must be** purchased by the fire alarm system installer prior to setting up a new account.

- The General Contractor shall email the COS Facilities Department at **FMCONTRACTS@SCOTTSDALEAZ.GOV** to request a new fire alarm system account to be set up. Include the fire alarm installer's name, point of contact, phone number and email address. Copy the COS inspector and Construction Administration Supervisor on the email.
- **FIRETROL** shall then contact the fire alarm system installer for programming the dialer, installation coordination, signal transmission testing, zone identification, etc.
- The fire alarm system installer shall install a system information sticker provided by **FIRETROL** on the new fire alarm panel.

3. Modifying an Existing Fire Alarm System.
 - The General Contractor shall email the COS Facilities Department at **FMCONTRACTS@SCOTTSDALEAZ.GOV** to notify the city of a system modification. Include 1) a description of the modification(s), and 2) the fire alarm installer's name, point of contact, phone number and email address. Copy the COS inspector and Construction Administration Supervisor on the email.
 - **FIRETROL** shall contact the fire alarm system installer to coordinate system modifications.

4. Existing Fire Alarm System Coordination for Panel Shutdown or Test.

- **The General Contractor shall call Arizona Security at 602.433.1271** a minimum of one business day (24 hours) prior to a system shutdown/test. The General Contractor shall then send email the COS Facilities Department at **FMCONTRACTS@SCOTTSDALEAZ.GOV** to notify the city of the shutdown. Copy the COS inspector and Construction Administration Supervisor on the email.
Include 1) the reason for the shutdown, 2) building name, address and/or number per the Monitoring Information sticker on the fire alarm panel, 3) the fire alarm/sprinkler system installer name, point of contact name, email and phone number, and 4) the start/stop time/date of the shutdown/test.
FIRETROL will then be notified to physically set the alarm panel in test mode. The General Contractor shall coordinate with **FIRETROL** to re-set the fire alarm panel after the work is completed.
- **Call Arizona Security at 602.433.1271** to cancel, reschedule a shutdown/test, or to report an accidental shutdown.

F. Photovoltaic Systems

1. Exterior wire gutter shall be the ventilated type.
2. All system conductors shall be in dedicated conduits, junction boxes, etc.
3. Multi-conductor cables shall not be used without written pre-approval from COS.

G. Security, Notification, and Access Control System Coordination

1. Verify required conduits, sleeve placement through inaccessible spaces, requirements for access control points, sleeve locations, door hinge requirements, cable routing through fire rated walls, device locations, door/door frame access requirements, etc. with the architect, COS vendors, and access control system installer prior to installation.

Section 11: Labeling and Identification

A. Underground Utilities

1. All underground services, including but not limited to, potable water, sewer, gas, electrical, and communications shall be identified with 6" wide, color coded, metal detectable polyester warning tape with wording specifically identifying the utility installed per the table below. Generic yellow plastic warning tape shall not be used.
2. Trenches wider than 24" shall have one additional strip of warning tape, equally spaced, per each additional 12" of width.
3. There shall be warning tape installed for each type of service in the same trench.
4. Replace tape removed during demolition/excavation with new.
5. Warning tape is not required under building pads.
6. Warning tape shall be placed per the following table:

Trench depth	Warning Tape Depth
Up to 24"	6" below finished grade
Deeper than 24" up to 36"	12" below finished grade
Deeper than 36"	24" above utility

B. All Equipment Located Above Grid Ceilings

1. All electrical, mechanical, plumbing, HVAC equipment, etc. located above grid ceilings shall have labels on the ceiling grid with their construction document identification.
2. Fire alarm junction boxes shall be labeled with the zone number(s) the circuiting serves. *Example: "FA Zone 3".* Circuiting inside the junction box shall have labels indicating which zone they serve. *Example: "2".*
3. Labels shall have a clear background and black $\frac{1}{4}$ " minimum letters. *Example: "FCU-1" or "Water Valve #15" or "Exhaust Fan #12".*

4. Damper handles, water valves, etc. shall have a 12" section of non-flammable warning tape attached to it per the following table:

Item	Color
HVAC duct damper handles	Orange
Potable water valves	Blue
Natural Gas valves	Red

C. Plumbing and HVAC System

1. All piping above accessible ceilings shall have self-adhesive labels indicating the type of service and an arrow indicating direction of flow. Labels shall be placed at room entry/exit points and every 20' in between. Exposed piping shall have labels every 50' per COS direction. Exterior piping shall have coil or strap type PVC, UV resistant labels.

D. HVAC

1. All HVAC equipment shall have a plastic label permanently attached to the equipment disconnect with the equipment name, voltage, and panel/circuit number. Exterior equipment shall have a sunlight resistant label. *Example: "AHU-3, 208V, L4-32,34,36". Place a duplicate label on the equipment housing if the disconnect is more than 6' from the equipment.*

2. All HVAC ducts shall have 4" x24" self-adhesive labels with a yellow background and black letters defining type of duct, the unit serving it and an arrow indicating direction of flow. *Example: "AHU-5 Return Air". Labels shall be placed at room entry and exit points. Exposed ducts shall have labels every 100' (per COS direction) and every 20' in accessible ceiling cavities. Labels shall be placed on the bottom of duct. Exhaust fan ducts that route directly up from the unit to the roof do not need labeling.*

3. All Split System Direct Exchange Systems shall have a plastic label permanently attached to the equipment with the refrigerant type and charge weight. *Example: "R410A, 4 lbs."*

E. Electrical

1. Panel schedules shall have specific device and location information matching Construction Document room numbers and room descriptions. Schedules shall be typed or neatly written in block letters. *Examples: "Receptacles: offices 101, 102, 103" or "Lighting: south parking lot" or "AHU-4: rooftop"*

2. Circuits in exterior in-ground pull boxes shall be labeled with waterproof labels indicating the circuit number. *Example "16"*

3. Light switch/receptacle and exposed junction box cover plates shall be labeled with their panel/circuit numbers. Labels shall have a clear background and black $\frac{1}{4}$ " letters. *Example: "L-32"*

4. All electrical equipment shall have a plastic label permanently attached to the equipment disconnect with the equipment designation, voltage and panel/circuit number feeding it. Exterior equipment shall have sunlight resistant labels. *Example: "Pump #1, 480V, H1-32,34,36"*

5. Label each grounding electrode conductor connected to the SES ground bus with its connection description and location. *Example: "water pipe, room #107"*

6. Install Arc Flash Warning Labels on the dead front of all electrical panels with information provided by the Electrical Engineer. Labels shall be dated. Submit sample of the label to COS for review prior to installation.

F. Plumbing

1. Zone valves shall be sequentially numbered with a brass tag beginning with #1 at the main valve. Zone valve access panels shall be labeled. *Example: Water Zone Valves #1 and #2*

2. Isolation or bypass valves on individual pieces of equipment do not need to be labeled.

G. Building and Room Signage

2. Email RFRANKLIN@SCOTTSDALEAZ.GOV to receive COS Enhanced ADA Wayfinding Sign System Standards for building and room signage requirements. Please include the project name in your request.

Section 12: As Built Drawings

A. General Requirements

1. The goal is to produce a set of documents so that those who have no prior knowledge of the project can easily find and understand information.
2. As-built drawings shall be maintained daily and kept current during construction.
3. All as-built drawings shall have "As Built" stamped on them.
4. All RFIs shall be clearly and legibly referenced on final as built sheets. Indicate the item affected by the RFI with an arrow or area affected by the RFI with a cloud. Include a bullet point description of the RFI. *Example: "RFI #122: dimensions"*
5. If an RFI refers to multiple details/drawings, RFI callouts shall be on all the details/drawings that are referred to in the RFI.
6. Locate the grounding electrode conductor connection points on the electrical as built drawings. *Example: "water pipe connection to grounding electrode system"* indicate with an arrow to the location.
7. All as-built information added to drawings shall be clearly distinguishable (darker, bolder, etc.) from the base bid information.
8. Added notes, references, clouded areas, etc. shall not block out other relevant information such as dimensions, notes, etc.
9. All notes shall be written with clear and concise wording.
10. Drawings, etc. shall be printed dark enough and at a scale that allows them to be readable on a $\frac{1}{2}$ scale set of prints.

B. Requests for Information (RFIs) that pertain to specifications or other non-drawing items shall be referenced on the first sheet of the discipline it applies to. *Example: "RFI #45: specification section 264500, wiring size"* would be on the first electrical sheet.

C. Civil/Utility Drawings

1. When existing underground utilities are encountered during excavation, document their location with dimensions from two fixed positions, the type of utility, if it was damaged and repaired, if abandoned, and the burial depth. Indicate the general direction of the utility with an arrow.

Example 1: 4" water @ 36", repaired

Example 2: 6" sewer @ 36", 2" fiber optic @ 24"

Example 3: 2" electrical @ 24", empty and abandoned

Example 4: 1" electrical @ 24", conduit repaired, #12 wires replaced

2. As-Built Civil drawings shall be stamped by a Registered Land Surveyor.
3. Locate soft copper potable water joints and all irrigation/plumbing, etc. sleeves under roadways, sidewalks, pads, etc. with their sizes and burial depth. *Example: (2) 4" @ 18"*

D. Electrical Riser As-Built Drawing

1. Use an existing or develop a CADD/computer generated electrical riser diagram to show as built conditions that include all parts of the distribution system including transformers and branch panels. Indicate room number/room name next to the equipment. *Example: "Electrical Room 103"*
2. A separate photovoltaic system riser diagram shall clearly define a shutdown sequence of operation
3. Post framed (with a Plexiglass cover) 11"x17" copy of the riser diagram(s) in a room designated by COS. If required for readability, provide larger, framed drawings. COS to review and approve drawings prior to framing and posting.

E. Plumbing Riser As-Built Drawing

1. Use an existing, or develop a CADD/computer generated wastewater riser and potable water riser diagrams to show as built conditions that include all fixtures, clean out locations, numbered valves, water lines, etc. Draw a box around fixture clusters and identify with room name/number, indicate location of individual items such as drinking fountains and clean outs. Include in the as-built drawing set.
2. Post framed (with a Plexiglass cover) 11"x17" copies of the riser diagrams in a room designated by COS. If required for readability, provide larger, framed drawings. COS to review and approve drawings prior to framing and posting.

F. Plumbing Video

1. To verify that drainage lines are clear and free from construction debris, dips, damage, etc., all main drainage lines 3" and larger shall be videotaped from their end of the line cleanout to where the line intersects with another/larger drain line and/or where it connects to the manhole/main sewer line servicing the building. Branch lines 3" and larger and over 25' feet shall also be videotaped.
2. Use the plumbing waste line riser diagram to make a PDF map of the drainage lines required to be videotaped. Color code and label runs (Example: Line # 1, Line #2, etc.) on the riser diagram. Indicate which end of the run the video starts at. Video clip labels shall match the riser diagram.
3. If remedial work (line flushing due to debris, repairing unacceptable dips in the line, etc.) is determined to be required after the initial videotaping, re-videotaping is required to confirm that remedial work was successful. Do not include video clips of failed sections in the final plumbing DVD.
4. The video tape shall continuously measure and display the one-way distance the camera travels through the piping. The video clip of each run shall also clearly record the surrounding area to document where the camera enters/exits a clean out.
5. The video shall be made be submitted to COS for final review and approval **prior to the building pad being poured.** The video shall be in an MP4 format

G. Final As-Built Review, Drawings, and DVDs

3. Prior to final DVD submittal, provide (1) 14" x21" size set of As-Built drawings for COS review and comment. Update and resubmit as required until final approval by COS. Return all drawings, etc. with COS comments.
4. DVDs shall be re-writable. Label each DVD with project name, COS project number and the phrase "As Built Documents"
5. Only create project applicable files. *Example: If there is no HVAC in the project, do not add a blank HVAC WARRANTIES file.*

Final As Built Drawing submittal to include copies of the following:	
Half-size (14" x 21") set of bound As-Built drawings	(1) set
Sets of DVDs	(2) sets
Final As Built Drawing DVD submittal to include the following:	
<p>Final As Built DVDs shall include the following (10) PDF files/folders <u>labeled exactly as shown in bolded text</u> inside a MAIN FOLDER. The Main Folder shall be labeled with 1) the project name, 2) the COS project number, and 3) the year the project was completed. <i>Example: Fire Station #205 Remodel, COS Project # P03A, 2023</i></p> <p>Do not include empty file folders. All items below shall be inside the MAIN FOLDER.</p>	
01 Warranties, Inspections, and Contact Information <u>Contractor Contact Information:</u> Contractor/ subcontractor, the service (plumbing, roofing, etc.) they provided and contact information <u>Inspections:</u> Third party inspection reports including, but not limited to, County or State inspections, Fire Marshal, water meter, backflow inspections, water quality, asbestos abatement, electrical testing, elevator, pest control, boiler, the Final HVAC Test and Balance Report, lowest floor verification certificate, etc. <u>Do not</u> include O&M product warranty information, county air quality or geotechnical reports. <u>Warranties:</u> Certificate of substantial completion and individual contractor/subcontractor warranties.	One Folder with (3) Files
02 Construction Drawing CADD Files Provided by the architect. Generic floor plans and site plans only.	One Folder
03 Videos Plumbing Videos: See Section 12 for requirements Training Videos: As required per specifications	One Folder
04 As Built Drawings	One File
05 Specifications Project Specifications and Soils Report	One File
06 RFIs and ASIs	One File
07 HVAC Warranties Equipment Warranty Registration: This folder shall have extended warranties (more than 1 year) for all HVAC equipment components such as compressors, etc. See specifications for those items. These shall be registered by the contractor with the manufacturer. Copies of these registrations and a registration summary sheet for all components with the unit names, serial numbers, the components warrantied and the warranty expiration dates shall be included.	One File
08 Approved Products This folder shall have the final, approved product submittals.	One File
09 O&M Manuals	One File
10 SWPPP All SWPPP documentation, drawings, inspection reports, etc.	One File

Section 13: Preferred Products

REMINDER: Without specific written consent given prior to bid by the City of Scottsdale, product catalog numbers and/or descriptions listed below shall take precedence over those listed in other specification sections and/or those reviewed/approved by the architect/engineer.

A. Prior Approval

1. For products or catalog numbers not listed, refer to the project specifications. When a preferred manufacturer is listed and the acceptable alternate is named as "May Submit", alternates must be meet or exceed the functional ability and quality of construction of the preferred manufacturer's product. Approval of those alternate products shall be per the sole discretion of COS.

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
Section 2: Landscape Irrigation System				
Sprinkler Pipe Glue	Weldon	721 or 725	May Submit	Weldon P70 primer shall be used
Irrigation Controller	Baseline	BL-1000	NONE	10-year warranty required. Connect controller to the IT connection point. Confirm ethernet cable catalog number with the City prior to installation. Provide dedicated 120V circuit.
Industrial Flow Meter	CTS	FSI T-Series PVC	NONE	Install in separate valve box next to master valve
Two Wire Path	Paige	P7072D	NONE	Use two different colors when there is more than one pathway.
Biocoders	Baseline		NONE	For flow valves, master valves, and valve bcoders
Sprinkler Heads	Rainbird	RD1804-SAM-PRS-NP Series	NONE	As required by design: Rainbird 5000 Series (5004) Rainbird 8005SS Rainbird 752 Series
Quick Couplers	Rainbird	44-LRC		In Carson #910 valve box
Irrigation Valves	Hunter	ICV-G-FS-R	NONE	Drip valve and Y-strainer/Pressure regulator shall be in separate valve boxes
Drip Valve Pressure Reducer	Senninger	PRLV40M4F4FV	NONE	150 stainless steel mesh with flush cap
Hydrometer	Netafim	BL-BHM-200	NONE	Size as required
Valve Boxes	Carson		May Submit	Bolt down T cover. Color as required.
Ball Valves	Wilkins	850XL	Landscape Products	Lead free full port bronze valve w/stainless steel ball handle
Isolation Valves	American Flow Control	2500 Series AWWA C-509/515	Nibco MJ-619-RWS-SON	
Multi-Outlet Emitters	Bowsmith	ML220/210/206	NONE	
Mainline Pipe 1"-3"				Schedule 40 PVC
Mainline Pipe 4"-6"				C900 Class 235 SDR 21 PVC
Lateral Piping ¾"-3"				Schedule 40 PVC
Backflow				See Plumbing Section 9
Meter				All landscape systems shall have a dedicated water meter.
Section 3: Roofing				
Modified Bitumen system	Performance Roof Systems Inc.	(Formerly Derbigum)	Firestone Johns-Manville	
Section 4: Interior				
Paper towel dispenser	ASI	8522	Bobrick B-2860	

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
				May Submit: Stainless Steel, manual feed Keylock (must match ASI/Bobrick key)
Paper towel dispenser/waste receptacle	ASI	04692-9	Bobrick B-39619 May Submit: Stainless Steel, manual feed Keylock (must match ASI/Bobrick key)	
Toilet paper dispenser	ASI	0040	Bobrick B-2892 May Submit: Stainless Steel, Twin jumbo roll, Keylock (must match ASI/Bobrick key)	
Toilet paper dispenser FIRE STATIONS ONLY	Bobrick	B-540	May submit. Stainless steel, surface mounted, double roll with utility shelf	
Hand soap dispenser	ASI	5001-SS	Bobrick B-26627 May Submit: Stainless Steel, Keylock (must match ASI/Bobrick key)	
Sanitary napkin disposal	ASI	Roval Series 20852	Bobrick B-270 May Submit: Stainless Steel	
Baby changing station	ASI	9013-9	May Submit: Stainless Steel	
Adult changing station	Foundations	100-SSE	May Submit: Stainless Steel	
Hand Dryer	ASI	0196-93	Excel TA-SB May Submit: Surface mount, Satin/Brushed Stainless Steel with a 4" maximum projection from the wall	
Wall/ceiling access doors				Stainless Steel with screwdriver latches
Restroom Stall Panel				Continuous hinges and brackets
Restroom Stall Doors				Sight strips or overlapping door panels
Section 5: Hardware/Gates				All finishes shall match Best #626
Hinges	Stanley	661HD	Roton, Hager	Continuous hinge heavy duty exterior doors
	Stanley	CB199xNRP	Roton, Hager	Heavy duty exterior doors
	Stanley	CB168	Roton, Hager	Heavy duty interior doors
	Stanley	CB179	Roton, Hager	Medium duty interior doors
	Stanley	CECB179-66	NONE	Electric
Exterior Locksets	Best	45H	NONE	45H mortise series x 15H trim
	Best	45HW7DEU-IDH-LMS	NONE	Electric
	Best	9K DEU	NONE	Electric, power supply by Best
Interior Locksets	Best	9K Cylindrical Series	NONE	15D lever, S3 strike package
	Von Duprin	RXS1	NONE	RX switch for electric lockset
	Securitron	TSBC	NONE	Door loop for electric lockset
Key System	Best	7pin removable core cylinder	Standard Cormax	Keyway shall be designated by COS
Closing Device	LCN	4041	NONE	EDA arms on all exterior and heavy traffic doors
ADA Open/Closing Device	LCN	LCN4642		Include pushbuttons and MS Sedco kit
Exit device	Von Duprin	99E, 99 Rim	NONE	Lever trim for electric lockset, Trim defined by COS
Mullions	Von Duprin	KR4954	NONE	Standard door, size and finish determined by COS
Mullions	Von Duprin	KR 9954	NONE	Fire door

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
Deadbolts	Best	83T series	NONE	Individual door function to be defined by COS
Door Stop	Trimco	1220-5	May Submit	Kick down type
Wall Bumpers	Trimco	1270CV	May Submit	Concave center
Storefront framing				Med. 6" style, 10" top/bottom frame, welded inner joints
Overhead doors	Overhead		May Submit	Commercial grade, 100,000 cycle springs.
Bi-Fold Doors	Door Engineering	FF30 (four-fold doors)	May Submit	Doors shall have hinge guards, monitored electric safety edge, interior swing path safety edge, exterior light curtain photo eye, interior presence sensor, audio/visual warning beacon, wall mounted emergency stop button, safety bollards
Overhead door Controller	Overhead Door	RSX: trolley version RHX: wall mount version	May Submit	Trolley or jackshaft version per architectural plans. The safety edge shall be connected to the controller with a coiling cord cable. Take up reels are not acceptable. Mount the photo eye to the wall, use FMC to connect to the photo eye.
Automatic rolling gate Controller	Hy Security	Trailhead gates: Slide Smart DC HD Series (HD15 or 25, etc.) All other locations: Slide Driver Hydraulic Series	May Submit	Gates shall have an electric motor (with soft start and stop) and hydraulic drive. The operator shall be sized for a gate 50% heavier than the gate installed. The controller shall be equipped with a remote release to allow the motor wheels to disengage without the need to open the motor enclosure cabinet which shall be fully sealed to prevent rodent access, wireless safety edges shall not be allowed. Gate drive rail to be located approximately at the midway point (or higher) of the gate.
Gate Photo Eye	Omron	E3K-R10K4-NR	May Submit	Outdoor rated.
Section 7: HVAC				
Cooling Tower water treatment control panel	Lakewood	NXCS	NONE	Lakewood NexSys Single Control System
Pumps				Back pull-out style, end suction, close coupled base mounted
Evaporative coolers	United Metal	Low Static:Fan Air High Static:Cel Air	May Submit	Stainless steel with automatic flushing system, CELdek or Glasdek media
Diffusers				Step down style
Unit filters				Pleated, 2" minimum
Boilers	Parker		May Submit	Proposed boiler alternate shall have local manufacturer's representation, local availability of parts and no proprietary maintenance or service restrictions
Condenser Unit Accessory				All condenser units shall have hail guards
Section 8: HVAC Building Automation System				
System components shall be provided by one of the two manufacturers and installed by one of the approved local contractors listed below. System components include all operator workstation software, controller software, custom application programming language/controllers, and specific/custom application controllers. The front end JACE shall be Niagara and shall be 100% compatible with the existing COS system. The specific Niagara version shall be reviewed and approved by the COS Facilities Department prior to installation. Email FMCONTRACTS@SCOTTSDALEAZ.GOV to coordinate review/approval.				
System Components:	Schnider	SE8xxx Series	NONE	Approved Local Contractors:

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
When there <u>IS</u> a Fan Coil, RTU, and Heat Pump	Electric			Climatec, Havel
System Components: When there <u>IS NOT</u> a Fan Coil, RTU or Heat Pump <u>OR</u> when the SE8xxx Series cannot control the control sequence(s)	Distech Controls	ECB BACnet Series	NONE	Approved Local Contractors: Climatec, Havel
Section 9: Plumbing				
Water closet: wall mount	Kohler	K-84325-0	American Std. 2294.011EC May Submit	
Water closet: floor mount	American Std.	3461.001	Kohler K-96057-SSL May Submit	
Manual flush valve: Water closet	Sloan	111-1.6	Zurn Z6000	
Touchless Sensor Retrofit Kit: Water closet	Sloan	EBV89A	Zurn ZERK-CPM	
Urinal	American Std.	6590.001	NONE	
Flush valves: urinal (Manual)	Sloan	186-1	Zurn Z6003AV	
Lavatories: Drop in, cast iron	Proflow	PF20174	NONE	
Lavatories: Wall mount, cast iron	Kohler	K2867	NONE	
Faucets: lavatory (metering)	Moen	8886	NONE	
Touchless lavatory faucet	Moen <u>M8553: With # M99557</u> 4" deck plate and Acme # C25686 mixing valve		NONE	
Water lines: lavatory faucet	Fluidmaster	B6F16	16", 3/8"x3/8" female May Submit	
Faucets: kitchen	Moen	8701	Delta 100LF-HDF (single handle) May Submit	
Faucets: kitchen (Fire Stations ONLY)	Grohe	30211DC1 or 32298DC3	May Submit	
Faucets: bar	Fisher	84808-3525	T&S B-1141-XSCR4V15 May Submit	
Faucets: mop	Chicago	897-RCF	Proflow PF1119 May Submit	
Exposed p-traps			Chrome with clean out	
Hose bibs	Woodford	24P	May Submit	3/4"
Angle stops	Chicago	STC-31-00-AB	May Submit	1/4 turn, loose key
Disposals 3/4 HP (with power cord)	Insinkerator	Evolution Compact	Moen GT75C May Submit	
Backflow preventers	Febco	825Y or 825YA	NONE	2.5" and smaller piping with upstream brass strainer
Backflow preventers	Watts	909	NONE	3" and larger piping with upstream brass strainer
Shower valves	Moen	2590	May Submit	Integral stops with L2352 trim
Water hammer	Watts	LF15M2	May Submit	Pressure charged type
Water heaters	Naview	NPE Series	May Submit	Natural Gas Tankless (when applicable)

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
Storm Water and Sewage Ejector Pumps	Flygt	For pits 48" and greater in depth	May Submit	With separate receiving basin to catch solids, rail system and controller. May Submit different manufacturers for pits less than 48" in depth
Floor drains	Zurn		JR Smith May Submit	Shall have strainers and (if no trap primer) trap guards
Roof drains	Zurn		JR Smith May Submit	Nickel bronze grate, removable sediment bucket
Drinking fountains	Elkay	EZST18WS	May Submit	Interior, with bottle filler
Drinking fountains	MDF	493-18	May Submit	Exterior, with hose bib and pet fountain
Pet fountains	MDF	370SM	May Submit	Blue in color
Trap primer tap	Sloan	F-72-A1	May Submit	Tapped off water closet/urinal vacuum tube
Trap guard	Sureseal		May Submit	
Electronic Trap Primer	Precision	MP-500	May Submit	Cord and plug (4 trap primer lines max)
Section 10: Electrical				
Building Fire Alarm System	Edwards <u>EST-4: Voice System</u> <u>EST-IO-1000: Non-Voice System</u> <u>EST-IO-64: Non-Voice System</u> 64 or less addressable points		NONE	The fire alarm system shall be able to be programmed and serviced without the need of proprietary access codes from the manufacturer and/or vendors. The programming thumb drive shall be delivered to COS
Building Fire Alarm Radio Monitor	AES	7707P-88-ULP-M	NONE	Letter required from COS to purchase. See section 10 for instructions. Leave WIFI USB inside the FACP. Provide dedicated receptacle and 120V circuit to monitor
Building Fire Dry Suppression System	Kidde	Aries Series	May Submit	Clean Agent shall be NOVEC 1230. Panel to interface directly with the AES Radio Monitor when there is no main FACP.
Building Fire Wet Sprinkler System	Concealed style sprinkler heads shall be used in all hard lid ceilings. Semi Recessed Quick style heads with flex pipe shall be used in grid ceilings. Auto air vents shall not be used. Nitrogen shall be used in all air systems. All piping shall be black steel. Piping 2" and smaller shall be schedule 40, greater than 2" shall be schedule 10. Underground piping shall be poly wrapped ductile iron with tracer wire			
Emergency Generator	Kohler: w/ AMP Series Control Panel	Cummins: w/PCC Series Control Panel or May Submit. Proposed generator/control panel alternates shall be fully compatible (without field modifications to the generator control panel) with the Generator Monitoring Module and the existing COS generator monitoring system. Proposed alternate shall have local manufacturer's representation, local parts availability and no proprietary maintenance or service restrictions. Program generator to exercise for 15 minutes every Tuesday at 9am with no power transfer to the building.		
Generator Monitoring Module	OmniMetrix	TrueGuard PRO	NONE	Required for all control panels. Email FMCONTRACTS@SCOTTSDALEAZ.GOV to coordinate module purchase, installation, and connection to the remote monitoring system
Elevators and Wheelchair Lifts	Kone		May Submit	Gearless traction, elevator room not required. Proposed systems shall have local manufacturer's representation, local parts availability and no proprietary maintenance or service restrictions.
Light poles	N/A	N/A	NONE	All poles shall be aluminum
Light poles wire	N/A	N/A	All underground light pole wiring shall be XHHW	

Section 14: Spare Parts

Provide spare parts in their original packaging and deliver to COS at substantial completion. This chart does not supersede providing spare parts from other specification sections. If duplicate items are specified in those sections, the more stringent requirement shall take precedence. See Section 13: Preferred Products chart or other specification sections for manufacturer/catalog numbers not shown.

Equipment	Number required based on Building Square Feet			Comments
	Up to 10K sq. ft.	10K sq. ft. to 25K sq. ft.	Over 25K sq. ft.	
Paint	5 gallons	10 gallons	15 gallons	Five-gallon containers, color/sheen per COS direction
Section 5: Hardware				
Door Stop	5	5	5	Floor mount
Wall Bumpers	5	5	5	Wall mount
Cylindrical Locks	1	2	3	Best #93K7AB15DS3 (no substitutions)
Universal Mortise Locks	1	2	3	Best #45H7UNR15H (no substitutions)
Padlocks	5	5	10	Best # 21B722L (Approved Equal: Cormax)
Section 9: Plumbing*				
Water closet flush valve	1	2	3	
Water closet flush valve repair kit	5	10	15	
Urinal flush valve	1	2	3	
Urinal flush valve repair kit	5	10	15	
Lavatory faucet	1	2	3	
Lavatory faucet repair kit**	5	10	15	

*Only required if water closet, lavatory faucet and/or urinal installed. Touchless and/or Manual as installed.

**Manufacturer's touchless lavatory faucet repair kit to consist of solenoid, pistons, and infrared eye.